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SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
809 BURLINGTON PIKE
FLORENCE, KENTUCKY 41042
(606) 525-8542

ROBERT P. STEARNS, PE
E. T. CONRAD, PE
CURTIS J. SCHMIDT, PE
MARK L. SPECHER, PE
GARY L. MITCHELL, PE
DAVID E. ROSS, PE

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JEFFERSON COUNTY
WORKS DEPARTMENT
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EPC 2 3 4

Jefferson County Department of Public Works
401 Fiscal Court Building
Louisville, Kentucky 40202

Attention: Mr. Edward W. Robinson, P.E.

Subject: Analytical Results for Gas Samples Collected in Riverside Gardens on May 23, 1979.

Gentlemen:

Under this cover we are forwarding analytical results on gas samples collected in the Riverside Gardens area adjacent to the Lees Lane Landfill. A total of three gas samples were collected on May 23, 79. Two of these samples (hereafter referred to as Sample Nos. 1 2) were obtained from an abandoned water well on the southern end of Lucerne Avenue in Riverside Gardens. A third sample (hereafter referred to as Sample No. 3) was obtained from the loose soil in a backfilled trench which had been excavated for a gas line lateral to a Lucerne Avenue residence several doors to the north of the aforementioned residence.

All three samples were collected into 250 milliliter glass burettes using an air tight connection into the sampling probe and a hand held aspirator bulb. Sample Nos. 1 and 2 were collected from the top of the water well. Sample No. 3 was obtained by driving a 1 in. diameter steel well point approximately 3 ft. into the backfilled soil in the trench.

ample No. 2 was subsequently broken in transit. However, because t represents a replicate sample, no real loss in analytical value as realized. All samples were shipped to the University of incinnati for analysis on a Perkin-Elmer gas chromatograph. nalysis was performed on May 29 and analytical results calculated May 31.

sults are appended to this cover letter as Table 1. As shown two alyses were performed on each of Sample Nos. 1 and 3. Close rrelation of results for repeat analyses was noted for both mples. Methane was found to be zero in Sample No. 1; other gas

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constituents indicate that the sample collected was similar to atmosphere. Before this sample was collected a gas meter was used to monitor methane gas concentrations in the field. Initial readings up to 30% and 40% methane by volume were recorded on the meter. However, after continuous pumping with the hand-held aspirator, negative pressures developed in the well and methane readings became zero. The gas analytical results corroborate this zero methane reading. We would like to point out, however, that the 0% methane results may be due to a negative pressure situation realized from falling ground water levels, etc. Although this well was fully 1300 feet from the landfill, it is entirely possible that explosive gas concentrations do exist in the sub-surface at this point due to the fact that this well reportedly penetrates the ten to fifteen foot clay layer at the top of the soil.

As shown by the analytical results for Sample No. 3, methane was not detected in the shallow subsurface of the backfilled gas trench. This reading does not support results obtained by the Louisville Gas and Electric Company (which reportedly indicate the presence of methane and carbon dioxide at high concentrations). However, it should be pointed out that the excavation for the gas line did not penetrate the 10 to 15 ft. clay layer near the surface in this area. Therefore, negative methane results are not surprising. Carbon dioxide readings for both the analyses on Sample No. 3 were found to be in the range of 30 to 34%. Although we are at a loss to fully explain why the carbon dioxide is high while methane is essentially zero, one possible explanation may be that some organic materials (such as grass) were backfilled into the trench and that this is now decomposing anaerobically. In the early stages of anaerobic decomposition of organic matter, carbon dioxide can be generated in concerntrations up to 70%. At the same time methane would be generated in only trace concentrations, if at all.

In conclusion, we would like to comment that the positive meter readings found in the area of the water well at the end of Lucerne Avenue indicate that landfill gases may be migrating as much as 1300 feet from the landfill. This is not totally unexpected since we have previously monitored gases at similar concentrations of 30 to 40% as much as 900 ft. from the landfill. However, these results do not indicate that the gas is penetrating the 10 to 15 ft. clay seal near the surface. The results for Sample No. 3 do not support those of the gas company. We found no evidence of explosive gases in the soils near the surface.

We were happy to be of service to Jefferson County in this matter. If you have any further questions, please do not hesitate to call.

Very truly yours,

[signature]

J[illegible] J. Walsh, P.E.
Project Manager
SCS ENGINEERS

cc: Robert P. Stearns, SCS Long Beach